

## ABOUT THE MODEL 471 PFLUGERHAGGEN

by George P. Burdell

Editor's Note: Mr. George P. Burdell, who has contributed this article on the Model 471 Pflugerhaggen and some historical insight into Pflugerhaggens generally, is an authority on his subject although he is too modest to suggest that in his article. He is the proud owner of Sir Wallingford-Smith's Journal, to which he refers. The Wallingford-Smith family gave it to him after the scientist's death in recognition of their long association.

Mr. Burdell is the author of many papers, books, pamphlets, and articles, among them the influential "Three Place Tables of the Values of Pi for Small Circles" which Wallingford-Smith used extensively.

Mr. Burdell is probably best known, however, for his enduring stay at the Georgia Institute of Technology (Ga. Tech) as a student. He has registered for at least one course each quarter since 1908--but has never accepted a degree for fear that it would affect his position as spokesman for the undergraduates. From this position he has led the celebrated movement to grant degrees to anonymous students.

The authenticity of this restoration by Jim Cox of the Model 471 Pflugerhaggen is due to the detailed journal left by Sir Bryson Thames Wallingford-Smith who was chief scientist at the Pflugerhaggen Development Laboratories (Pflugerhaggenexperimenterfabrikwerk, GmBh) for 8 months in 1922. Sir Wallingford-Smith's early life had a great impact on his designs and is worth relating briefly.

His father, Sir Bryson Hull Wallingford-Smith, was a designer of cam-operated tappet plates for the steam engines of the cotton mills of middle England and had carried on a lengthy correspondence with Otto Lilienthal, the German glider pioneer. The senior Wallingford-Smith had been repeating each of Lilienthal's experiments and with stubbornness typical of his family, he resolutely repeated the one in which the German was fatally injured and was, himself, identically injured.

Upon his father's death, the young Wallingford-Smith resolved never to attempt to fly, but he was always heavily influenced by technical activities in the new aeronautical industry.

As an engineering officer in the Royal Flying Corps in 1917, he experimented extensively with a captured Fokker Triplane from which the wings had been removed. It was during these experiments that he discovered the principle of "translateral turbo-encabulation", which he obviously used in the Model 471 Pflugerhaggen.

During his assignment to occupation duty in Austria after the war, Wallingford-Smith met and married a young unicycle rider from a gypsy carnival named Matilda Kuykendahl. Matilda suffered an unfortunate eye injury in one of her husband's experiments with a Muehlenberg articulating resonator which had just been invented by Count Muehlenberg, the famous hero of the Watling Incident. As a result of her eye injury, Matilda was no longer able to maintain lateral stability of her unicycle. This led Wallingford-Smith to the construction of a two-wheeled unicycle (with the wheels located on a common transverse axle) which restored her lost lateral stability. She regained her elevated position in the carnival and went on to gain fame in her own right as the only two-wheeled unicycle rider in Europe. This work on the two-wheeled unicycle also had obvious influence on Wallingford-Smith's design for the Model 471 Pflugerhaggen.

Wallingford-Smith claimed a relationship between translateral turbo-encabulation and the generation of lateral stability as demonstrated in the two-wheeled unicycle and was knighted in 1919. But shortly afterward, the Royal Academy, in one of the most turbulent sessions in its history, accepted proof that the relationship did not exist and Sir Wallingford-Smith left England in a huff, never to return. This air of controversy stayed with Sir Wallingford-Smith throughout his life. He joined Matilda in the carnival but continued his scientific studies in his spare time.

It was during this time that I made his acquaintance and came to appreciate his genius, the sentimental irony he felt over his self-exile from his homeland, and the idyllic peace of his life with Matilda. He and I enjoyed many deeply technical discussions over the pros and cons of expressing  $\pi$  in

English or Metric units, but the thing I remember and value the most is a song that the three of us sang to the accompaniment of his wife's gypsy mandolin. Sir Wallingford-Smith had, during a short period of interest in numerology and mythology, constructed a list of the twelve principal Nordic gods and transposed the 1st and 3rd letters in their names. Matilda translated the results into her native gypsy tongue and set it to music. It was at once the most haunting, lyrical, and inspiring music that I have ever heard, and lent a peacefullness to our evenings that I have never been able to recapture. Unfortunately, the song is lost; I cannot find it in my memory and they apparently never wrote down either the words or the melody. Viewing this restoration of the Model 471 Pflugerhaggen has again caused my mind to catch fleeting passages of that lost music and restored something of the "feel" of those few weeks so long ago. Somehow I think there is something of it in each of his designs.

In May of 1921 Matilda's carnival act was engaged to participate in an industrial exposition near the Pflugerhaggen factory and the two-wheeled unicycle caused a great controversy among the Pflugerhaggen workers. The result was that the experimental designers (who contended that the lateral stability resulted from the unique juxtaposition of the wheels) were organized into the Development Laboratories and Sir Wallingford-Smith was hired to lead them. The production craftsmen (who had argued that the lateral stability was due to the shape of the seat) were assigned to the Production Division (Pflugerhaggenprotuctfabrikwerken, GmBh).

Sir Wallingford-Smith designed twenty-one Pflugerhaggens during his short stay with the company and the Model 471 was the most successful although none ever went into large-scale production. It is interesting to note that the great confusion in Pflugerhaggen model numbers is due to one of Sir Wallingford-Smith's idiosyncrasies. He insisted that model numbers for his designs be the value of Pi that he used in his design work for that particular model.

Although use of the translateral turbo-encabulator is the most obvious design feature of the Model 471, its family resemblance to the two-wheeled unicycle is also apparent. The Muehlenberg resonators are no longer available and vacuum cleaner extensions have been used in their place. The tappet plates are out of sight, being mounted beneath the wherter and manually operated by longitudinal push-rods in this model.

The exfoliated multiverters were obtained by addressing an order for them out of a 1931 catalog and were obtained at the original price.

Wallingford-Smith had used a pair of brass cannon balls mounted in cupped slides for ballast in his original design. These have long since been relegated to various museums around the world and as a result this restoration uses electrical ballast, a 1963 Chrysler Heavy Duty Generator appropriately positioned just forward of the translaterator carriage.

This restoration follows Sir Wallingford-Smith's color scheme in full detail. The Wallingford-Smiths had no children and died in an avalanche in the Yugoslavian Alps in 1935, exactly 1,221 days to the day after he retired.